UNIFIED COUNCIL
Foundation for Success

UNIFIED COUNCIL OLYMPIADS

UCO Unified Cyber Olympiad

UNIFIED CYBER OLYMPIAD

CLASS - 10

Question Paper Code : 3O119

KEY

1. A	2. C	3. A	4. A	5. A	6. C	7. A	8. B	9. A	10. C
11. D	12. C	13. D	14. D	15. D	16. A	17. C	18. D	19. D	20. D
21. A	22. C	23. C	24. B	25. A	26. D	27. D	28. D	29. A	30. D
31. C	32. D	33. B	34. B	35. A	36. A	37. C	38. C	39. B	40. D
41. D	42. B	43. D	44. A	45. B	46. B	47. B	48. C	49. D	50. D

SOLUTIONS

MENTAL ABILITY

01. (A) Given $\frac{x}{1} = \frac{\sqrt{a+3b} + \sqrt{a-3b}}{\sqrt{a+3b} - \sqrt{a-3b}}$

$\therefore \quad \frac{x+1}{x-1} = \frac{\left(\sqrt{a+3b} + \sqrt{a-3b}\right) + \left(\sqrt{a+3b} - \sqrt{a-3b}\right)}{\left(\sqrt{a+3b} + \sqrt{a-3b}\right) - \left(\sqrt{a+3b} - \sqrt{a-3b}\right)}$

$\frac{x+1}{x-1} = \frac{2\sqrt{a+3b}}{2\sqrt{a-3b}}$

Squaring on both sides.

$\frac{x^2 + 2x + 1}{x^2 - 2x + 1} = \frac{a + 3b}{a - 3b}$

$ax^2 + 2ax + a - 3bx^2 - 6bx - 3b = ax^2 - 2ax + a + 3bx^2 - 6bx + 3b$

$0 = 6bx^2 - 4ax + 6b$

$\therefore \quad 3bx^2 - 2ax + 3b = 0$

02. (C) $\frac{1}{p} + \frac{1}{q} + \frac{1}{r} = \frac{pq + qr + rp}{pqr}$

$= \frac{\left(\frac{c}{a}\right)}{\left(\frac{-d}{a}\right)}$

$= \frac{-c}{d}$

03. (A) Mass = V × D = π(R + r)(R – r)h × D

$= \frac{22}{7}\left(\frac{4.5}{2}+2\right)\left(\frac{4.5}{2}-2\right)77 \times 8$ gm/cc

= 2.057 kg

04. (A) $(x-1)$ is a factor means sum of coefficient are zero.

05. (A) If two numbers written in a prime factoristion, then their LCM is the product primes with highest powers

$\therefore$ LCM of $2^5 \times 3^6 \times 7^4 \times 11$ and

$2^6 \times 3^4 \times 5^6 \times 7^2 = 2^6 \times 3^6 \times 5^6 \times 7^4 \times 11$

06. (C) $s = \frac{a+b+c}{2} = \frac{9cm+40cm+41cm}{2} = \frac{90cm}{2} = 45cm$

Area of $\Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{45cm \times 36cm \times 5cm \times 4cm}$

$= \sqrt{9 \times 5 \times 9 \times 4 \times 5 \times 4cm^4}$

$= 9 \times 5 \times 4\ cm^2 = 180\ cm^2$

$\therefore \frac{1}{2} \times 9cm \times h = 180cm^2$

[$\because$ Shortest side altitude is longest]

$h = 180\ cm^2 \times \frac{2}{9cm} = 40cm$

07. (A) Let the present ages of the father and the son be 'x' years and 'y' years respectively

Five years ago, their ages were $(x - 5)$ years and $(y - 5)$ years

According to the problem

$(x - 5) = 7(y - 5)$

$\Rightarrow x - 5 + 35 - 7y = 0$

$\Rightarrow x - 7y + 30 = 0$

$\Rightarrow x = 7y - 30$ ..... (1)

Five years later, their ages will be $(x + 5)$ years and $(y + 5)$ years

According to the problem

$(x + 5) = 3(y + 5)$

$\Rightarrow x + 5 = 3y + 15$

$\Rightarrow x = 3y + 15 - 5$

$\Rightarrow x = 3y + 10$ ..... (2)

From (1) and (2), we have

$7y - 30 = 3y + 10$

$\Rightarrow 4y = 40$

$\Rightarrow y = 10$

$\Rightarrow x = 7y - 30$

$= 7(10) - 30$

$= 40$

$\therefore$ The present ages of the father and the son are 40 years and 10 years respectively

08. (B) Given $\sqrt{7}, 3\sqrt{7}, 5\sqrt{7}$ ____ are in AP

$\therefore$ a = $\sqrt{7}$ d = $3\sqrt{7} - \sqrt{7} = 2\sqrt{7}$

$s_n = \frac{n}{2}[2a + (n-1)d]$

$= \frac{n}{2}\left[2\sqrt{7} + (n-1)2\sqrt{7}\right]$

$= \frac{n}{2}\left[\cancel{2\sqrt{7}} + 2\sqrt{7}\,n - \cancel{2\sqrt{7}}\right]$

$= \frac{n}{\cancel{2}} \times n \times \cancel{2}\sqrt{7}$

$s_n = n^2\sqrt{7}$

09. (A) For option A

$\Delta = (-15)^2 - 4 \times 56.25 \times 1 = 225 - 225 = 0$

$\Delta = 0 \Rightarrow$ the roots are real.

for option B $\Delta = (-22)^2 - 4 \times 1 \times 125 = 484 - 500$

$\Delta = -16$

$\Delta < 0 \Rightarrow$ Roots are not real

for option 'C' $\Delta = 25 - 28 = -3$

for option 'D' $\Delta = 64 - 68 = -4$

10. (C) Side of square = HCF of length and breadth of the room.

1763 cm & 1927 cm

HCF = 41 cm

$$
\begin{array}{r}
1783\overline{)\,1927\,(1} \\
1763 \\
\hline
164\overline{)\,1763\,(10} \\
1640 \\
\hline
123\overline{)\,164\,(1} \\
123 \\
\hline
41\overline{)\,123\,(3} \\
123 \\
\hline
0
\end{array}
$$

$\therefore$ Least number of square tiles =

$$\frac{\cancel{1763}^{43}\text{ cm} \times \cancel{1927}^{47}\text{ cm}}{\cancel{41}_{1}\text{ cm} \times \cancel{41}_{1}\text{ cm}}$$

$= 2021$

11. (D) Given $a = 23$

$$d = a_2 - a_1 = 22\frac{1}{4} - 23 = \frac{-3}{4}$$

Given $a_n < 0$

$a + (n-1)d < 0$

$$23 + (n-1)\left(\frac{-3}{4}\right) < 0$$

$$23 - (n-1)\frac{3}{4} < 0$$

$$23 < (n-1)\ \frac{3}{4}$$

$$23 \times \frac{4}{3} < n - 1$$

$$\frac{92}{3} < n - 1$$

$30.6 + 1 < n$

$n > 31.6$

$\therefore$ Next integer of 31.6 is '32'

$\therefore$ $N = 32$

$\therefore$ a_{32} is the first negative term

$$\therefore a_{32} = 23 + 31 \times \left(-\frac{3}{4}\right) = \frac{92-93}{4} = \frac{-1}{4}$$

$$a_{31} = a + 30d = 23 + 30\left(\frac{-3}{4}\right)$$

$$= \frac{92-90}{4} = \frac{2}{4} = \frac{1}{2}$$

12. (C) Given $p(x) = x^3 - 9x^2 - 69x + 5$

Given $\alpha\beta\gamma = \frac{-d}{a} = -5$

$p(-5) = (-5)^3 - 9(-5)^2 - 69(-5) + 5$

$= -125 - 225 + 345 + 5$

$= -350 + 350$

$p(-5) = 0$

$\therefore$ -5 is the zero of $p(x)$

$$
\begin{array}{r|l}
 & x^2 - 14x + 1 \\
\hline
x + 5 & x^3 - 9x^2 - 69x + 5 \\
 & \cancel{x^3} + 5x^2 \\
\hline
 & 14x^2 - 69x + 5 \\
 & \cancel{-14x^2} - 70x \\
\hline
 & x + 5 \\
 & x + 5 \\
\hline
 & 0
\end{array}
$$

$x^2 - 14x + 1 = 0$

$a = 1,\ b = -14,\ c = 1$

$$\therefore\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-14) \pm \sqrt{(-14)^2 - 4 \times 1 \times 1}}{2}$$

$$= \frac{14 \pm \sqrt{196 - 4}}{2}$$

$$= \frac{14 \pm \sqrt{64 \times 3}}{2}$$

$$= \frac{14 \pm 8\sqrt{3}}{2}$$

$$= = 7 \pm 4\sqrt{3}$$

$\therefore$ $-5,\ 7 + 4\sqrt{3}$ & $7 - 4\sqrt{3}$ are the zeros of $p(x)$

13. (D) $3748x + 5467y = 10085$

$1731x + 7484y = 4034$

(–) (–) (–)

$2017x - 2017y = 6051$

$2017\,(x - y) = 6051$

$x - y = \frac{6051}{2017} = 3$

14. (D) Let speed of the sailer in still water be x kmph and speed of the stream be y kmph

$\frac{8h}{x+y} = 40 \text{ min} = \frac{2}{3} \text{ hour}$

$\therefore \quad x + y = \frac{24}{2} = 12 \longrightarrow ①$

Given $\frac{8h}{x-y} = 1$ hour

$\therefore \quad x - y = 8 \longrightarrow ②$

Eq. ① + ② $\Rightarrow x + \cancel{y} + x - \cancel{y} = 12 + 8$

$2x = 20$

$x = 10$ kmph

15. (D) Let the number of red balls be 'x'

$\therefore$ Total balls = x + 16

Probability of getting a red ball P(R)

$= \frac{x}{x+16}$

Probability of getting a blue ball P(B)

$= \frac{16}{x+16}$

Given P(B) = 2 × P(R)

$\frac{16}{\cancel{(x+16)}} = \frac{2x}{\cancel{(x+16)}}$

$x = \frac{16^{8}}{2_{1}}$

Number of Red balls = 8

REASONING

16. (A)

As Q $\xrightarrow{-4}$ M Similarly, Y $\xrightarrow{-4}$ U

I $\xrightarrow{+4}$ M A $\xrightarrow{+4}$ E

O $\xrightarrow{-4}$ K W $\xrightarrow{-4}$ S

K $\xrightarrow{+4}$ O C $\xrightarrow{+4}$ G

17. (C) The bottom left figure rotates 90° anti-clockwise and gets enlarged, the upper larger figure rotates 90° anti-clockwise and becomes smaller, the third figure is replaced by a new one and all the figures, then moves one side clockwise.

18. (D) FKUDVT

3 % 8 5 # 6 .

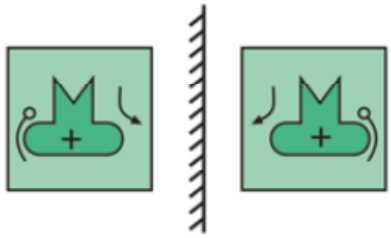
First and last elements are divisible by 3. so 6 is coded as T and 3 is coded as F.

% 8 5 # is coded as KUDV

Therefore 3 % 8 5 # 6 is coded as FKUDVT

19. (D) Z X V T R P (N) L J H F D B

20. (D)

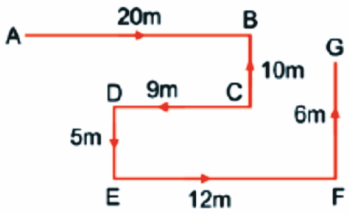


21. (A) P + N i.e., P is the mother of N, hence, the sex of P is determined as female.

Q ÷ P i.e., Q is the father of P. hence, Q ÷ P + N clearly means that P is the daughter of Q.

22. (C) In all other groups of letters there is no gap between first and second letters, gap of one letter between second and third letters, gap of two letters between third and fourth letters.

23. (C) The movements of the rat from A to G are as shown in figure.



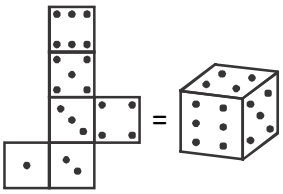
Clearly, it is finally walking in the direction FG i.e., North.

24. (B) disc above is the correct answer because scab is hidden between disc and above. Disgusting they may be, but scabs help us to heal by forming a barrier against infection.

25. (A) In the first figure, 5 = (5 × 1), 8 = (4 ×2), 4 = (2 × 2).

In the second figure, 6 = (3 × 2), 9 = (3 × 3), 4 = (2 × 2).

So, the digits of the missing figure are (6 × 1), (7 × 1), (4 × 2) i.e., 6, 7, 8.

26. (D) 

27. (D) As per conditions given, following is the position of 5 persons in a line

From left, editor is at the 4th place in the line

28. (D)

H	O	R	T	I	C	U	L	T	U	R	E
1	2	3	4	5	6	7	8	9	10	11	12

Option (A) : R O E T C H L U I U T I

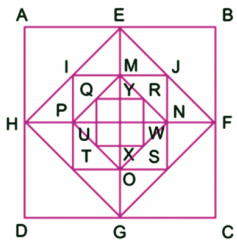
Option (B) : H O R T E C U L T U R I

Option (C) : T H I O L R U I U E C T

Option (D) : H O R T I C U L T U R E

29. (A) ENE – The complete word is FIRGHTENED.

30. (D) The figure may be labelled as shown.



The simplest squares are QVYU, VRWY, YWSX and UYXT i.e. 4 in number.

The squares composed of four components each are IMYP, MJNY, YNKO, PYOL and QRST i.e. 5 in number.

The squares composed of seven components each are AEYH, EBFY, YFCG and HYGD i.e. 4 in number.

The only square composed of twelve components is MNOP.

There is only one square i.e. IJKL composed of sixteen components.

There is only one square i.e. EFGH composed of twenty-four components.

There is only one square i.e. ABCD which is composed of twenty-eight components.

Thus, there are 4 + 5 + 4 + 1 + 1 + 1 + 1 = 17 squares in the given figure.

COMPUTERS

31. (C) Slide Show → Used to view the slides in presentation mode.

- Slide Transition → Adds effects when moving from one slide to another.
- Custom Animation → Adds effects to individual objects (like text flying in, spinning, fading).
- Text Animation → This is not a specific option in PowerPoint; text effects are applied via Custom Animation.

32. (D) We enter 3 types of data in cells : labels, numbers and formulae.

33. (B) Privacy is about protecting personal information from unauthorized access.

- Plagiarism → Copying someone else's work.
- Intellectual Rights → Protects inventions, trademarks, or creations.

34. (B) In MS-Access to open an existing database we should press ctrl + O

35. (A) HTML is case sensitive, not correct statement.

36. (A) The active cell (the one currently selected) is highlighted with a thick, dark border so you know where you are typing.

A dotted border appears inside the cell only when copying or during certain operations, not for normal selection.

37. (C) Lookup Wizard lets you create a field where users can choose values from another table or a list.

It is not specifically for selecting Excel values, though you can import them separately.

38. (C) Object Browser shows all objects, their properties, methods and events.

Form Layout Window → For designing forms.

Code Editor Window → For writing code, not for browsing all objects.

39. (B) Custom Slide Show → Allows you to create a new slide show using existing slides, arranged in any order you want.

Rehearsal → Used to practice timing of slides.

Slide Show Setup → Sets options like looping, monitor selection, and slide range, but doesn't reorder slides.

Slide Show View → Simply runs the presentation in full-screen mode.

40. (D) Barchart. Used to show comparisons between different items of date and which run horizontally on the page.

41. (D) In MS-Access (or similar database/report design tools), you can select multiple controls (like text boxes, labels, buttons) using any of these methods:

1. Shift key → Click each object while holding Shift to select multiple objects.
2. Ruler selection → If controls are aligned, clicking the horizontal or vertical ruler selects them along that line.
3. Ctrl key → Click each object while holding Ctrl to select multiple objects individually.

42. (B) =sum(D_1 : D_5) is used to add all numbers in a range of cells where as in option (A, C) the function add only two numbers.

43. (D) An Ms-powerpoint slide can be combination of text, graphics, audio, video, animation and text.

44. (A) MS-Access is a DBMS software.

45. (B) 'OL' is used in HTML to order a list.

ENGLISH

46. (B) Obsolete means no longer in use or out of date.

Modern/current → Opposite meaning.

Useful → Not the same meaning.

47. (B) Fastidious → Very attentive to detail, meticulous.

- Lethargic → Lazy or slow.
- Obstinate → Stubborn.
- Voracious → Very eager or hungry.

48. (C) next to → Preposition (shows relationship with "her").

next → Adverb (modifies "said" in "what next?").

49. (D) Correct sentence: "The army sent the colonel to patrol from the plane."

- Other options have wrong words like "carnal/karnal/petrol" which don't make sense.

50. (D) Original sentence → Future perfect tense (active)

Change to passive voice → Subject becomes object, verb adjusts: will have been sown.